Version 3 of the Global Aridity Index and Potential Evapotranspiration Database

Abstract

The "Global Aridity Index and Potential Evapotranspiration Database - Version 3" (Global-AI_PET_v3) provides high-resolution (30 arc-seconds) global hydro-climatic data averaged (1970–2000) monthly and yearly, based upon the FAO Penman-Monteith Reference Evapotranspiration (ET0) equation. An overview of the methods used to implement the Penman-Monteith equation geospatially and a technical evaluation of the results is provided. Results were compared for technical validation with weather station data from the FAO "CLIMWAT 2.0 for CROPWAT" (ET0: $r2 = 0.85$; AI: $r2 = 0.90$) and the U.K. "Climate Research Unit: Time Series v 4.04" (ET0: $r2 = 0.89$; AI: $r2 = 0.83$), while showing significant differences to an earlier version of the database. The current version of the Global-AI_PET_v3 supersedes previous versions, showing a higher correlation to real world weather station data. Developed using the generally agreed upon standard methodology for estimation of reference ET0, this database and notably, the accompanying source code, provide a robust tool for a variety of scientific applications in an era of rapidly changing climatic conditions. Measurement(s) evapotranspiration Technology Type(s) Geographic Information System Sample Characteristic - Environment climate system Measurement(s) evapotranspiration Technology Type(s) Geographic Information System Sample Characteristic - Environment climate system